The Hart School - Faculty of Science
Yr10 Curriculum Overview

Curriculum Intent: Science encompasses everything that we are and allows us to make sense of the world around us. Science at The Hart School is more than just a core subject. We believe an outstanding science education should develop students' curiosity and scientific knowledge to question the world in which we live, enable critical-thinking and encourage students to become socially aware global citizens.

Our Science faculty has planned an inspiring, inclusive, and diverse curriculum that is designed to engage and enthuse students with the real-life applications of the subject whilst promoting ambition and aspirations for their future.

In an ever-changing world, in which STEAM subjects are at the forefront of advancements for the future, we want to prepare our students for this by not only looking at the knowledge of the subject, but also the methods, processing skills and applications associated with it. This ensures that our students are scientifically literate, able to evaluate what they see in the news and the world around them and make informed decisions that will affect their future lives and the planet.

GCSE Science Routes:

AQA GCSE Combined Science: Trilogy **OR** **AQA GCSE Biology** **AQA GCSE Chemistry** **AQA GCSE Physics**

All students in Year 10 will be taught by three specialised teachers for Biology, Chemistry and Physics. The curriculum overview below outlines the topics that will be taught in each term.
Students who study Triple and Combined Science will study the same themes. Those who elect to study Triple Science will learn additional content within each theme to further develop understanding and the bigger picture

	Autumn							Spring					Summer				
Core Course Topic: These topics are taught in small bitesize chunks and revisited regularly.	**B1 Cell Biology (Key Ideas)**	**C1 Atoms and the Periodic Table (Key Ideas)**	**P1 Energy (Key Ideas)**	**B2 Organisation**	**C2 Structure and Bonding**	**P2 Electricity**		**C3 Quantitative Chemistry**	**B3 Infection and Response**	**P3 Particle Model of Matter**	**C4 Chemical Changes**		**C5 Energetics**	**P4 Atomic Structure & Radiation**	**B4 Bioenergetics**	**C6 Rates of Reaction**	
Additional support links: Here are links to additional resources which will help your child	AQA B1 support - BBC bitesize	AQA C1 support - BBC bitesize	AQA P1 support - BBC bitesize	AQA B2 support - BBC bitesize	AQA C2 support - BBC bitesize	AQA P2 support - BBC bitesize		AQA C3 support - BBC bitesize	AQA B3 support - BBC bitesize	AQA P3 support - BBC bitesize	AQA C4 support - BBC bitesize playlist		AQA C5 support - BBC bitesize	AQA P4 support - BBC bitesize	AQA B4 support - BBC bitesize	AQA C6 support - BBC bitesize	
	B1 support video playlist	C1 support video playlist	P1 support video playlist	B2 support video playlist	C2 support video playlist	P2 support video playlist		C3 support video playlist	B3 support video playlist	P3 support video playlist	C4 support video playlist		C5 support video	P4 support video playlist	B4 support video playlist	C6 support video playlist	
Knowledge: Included here is the specific knowledge your child will learn in detail	Cell structure, eukaryotes and prokaryotes, cell specialisation, cell differentiation, stem cells, cell division and the cell cycle, diffusion, active transport, osmosis	Atoms, elements, compounds, mixtures, separating techniques, development of the atomic model, sub-atomic particles, electron configurations, patterns in properties and reactivity in the periodic table	Energy stores and systems, energy changes in a system, power, conservation and dissipation of energy in a system, efficiency, national and global energy resources	Animal tissues, organs and systems, the digestive system, the heart and blood vessels, coronary heart disease, health, risk factors, cancer, plant tissues and organ systems	Ionic, covalent and metallic bonding, states of matter, properties of bonding, allotropes of carbon	Current, potential difference, resistance, resistors, series and parallel , domestic electricity, power, the national grid		Conservation of mass, Relative formula mass, changes in mass when reactant or product is a gas, moles, balancing equations, limiting reactants, concentrations of solutions	Communicable disease and pathogens, human defence systems, vaccination, development of drugs	Changes of state, the particle model, density, internal energy, energy transfers, temperature changes in a system, specific heat capacity, pressure in gases	Reactivity of metals, extraction of metals and reduction, reactions of acids, pH scale and neutralisation , electrolysis		Exothermic and endothermic reactions, reaction profiles, calculating enthalpy changes,	Structure of an atom, isotopes, development of the model of the atom, radioactive decay, nuclear radiation, nuclear equations, contamination	Photosynthesis, uses of glucose. Aerobic and anaerobic respiration, response to exercise, metabolism	Calculating rates of reaction, collision theory, factors affecting rate of reactions, activation energy, catalysts, reversible reactions, dynamic equilibrium	
Skills: Included here is the specific skills your child will learn in detail	**Required practical 1:** Use a light microscope to observe, draw and label a selection of plant and animal cells. A magnification scale must be included.	Develop an understanding of why and how scientific methods and theories change over time.	**Required practical activity 14**: An investigation to determine the specific heat capacity of one or more materials.	**Required practical 3:** Use qualitative reagents to test for a range of carbohydrates, lipids and proteins.	Visualise and represent 2D and 3D forms including two-dimensional representations of 3D objects.	**Required practical activity 15:** Use circuit diagrams to set up and check appropriate circuits to investigate the factors affecting the resistance of electrical circuits.	**Assessment 1**	Substitute numerical values into algebraic equations using appropriate units for physical quantities. Use ratios, fractions and percentages. Change the subject of an equation. Recognise and use expressions in decimal and standard form.	Understand that the results of testing and trials are published only after scrutiny by peer review.	**Required practical activity 17:** Use appropriate apparatus to make and record the measurements needed to determine the densities of regular and irregular solid objects and liquids.	**Required practical activity 8:** Preparation of a pure, dry sample of a soluble salt from an insoluble oxide or carbonate, using a Bunsen burner to heat dilute acid and a water bath or electric heater to evaporate the solution.	**Assessment 2**	**Required practical activity 10:** Investigate the variables that affect temperature changes in reacting solutions such as, e.g. acid plus metals, acid plus carbonates, neutralisations, displacement of metals.	Students should be able to recognise expressions given in standard form.	**Required practical activity 5:** Investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed.	Determine the slope and intercept of a linear graph. Draw and use the slope of a tangent to a curve as a measure of rate of change.	**Assessment 3**
	Use prefixes centi, milli, micro and nano. Re-arrange, and use, the magnification equation to calculate magnification. Convert units between milli, micro and nano.	Safe use of a range of equipment to separate chemical mixtures.	Recall and re-arrange equations to calculate energy changes in a system. Convert between units and express values in standard form.	**Required practical 4:** Investigate the effect of pH on the rate of reaction of amylase enzyme.		**Required practical activity 16:** Use circuit diagrams to construct appropriate circuits to investigate the I–V characteristics of a variety of circuit elements,							Develop an understanding of why and how scientific methods and theories change over time.	Investigations into the effect of exercise on the body.	**Required practical activity 11:** Investigate how changes in concentration affect the rates of reactions by a method involving measuring the volume of a gas produced and a method involving a change in colour or turbidity.	